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AREA : OPERATIONS AUTOMATION/OPERATIONS MANAGEMENT

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TELECOMMUNICATIONS END-TO-END SYSTEMS MONITORING ON TOPEX/POSEIDON: TOOLS AND TECHNIQUES

ABSTRACT

The TOPEX/Poseidon Project Satellite Performance Analysis Team's (SPAT) roles and responsibilities have grown to include functions that are typically performed by other teams on JPL Flight Projects (FPO's). In particular, SPAT Telecommunications has expanded beyond the nominal function of monitoring, assessing, characterizing, and trending the spacecraft (S/C) RF/Telecom subsystem to one of end-to-end systems monitoring and management. This has been accomplished by the development of software that processes not only S/C telemetry, but also the Space Networkis ODM data, the NASCOM block poly error flags, and the telemetry minor frame CRC flags.

This paper will present the algorithms used to process the above data; and, usage of the information in:

1) Monitoring and analyzing the TOPEX-to-WSGT via TDRS link,

2) Monitoring and analyzing the NASCOM links - i.e. WSGT-to-JPL.

3) Assessing science data recovery performance.

4) Determining end-to-end performance.

5) Performing Failure/Anomaly Detection and Isolation (FDI) to the TOPEX link segments - i.e. TOPEX, TOPEX-to-WSGT via TDRS, and WSGT-to-JPL POCC via the NASCOM links.

By monitoring and managing the TOPEX link segments, 99.9% of the science data has been recovered with an integrity (BER) of better than 1 x 10-*, limited by NASCOM performance.

Results to be presented will include the techniques used to determine: 1) TOPEX-to-WSGT via TDRSS return link BER performance. 2) NASCOM performance. 3) overall science recovery performance - i.e. end-to-end BER. 4) the spacecraft tape recorders performance.

The results have implications to all EOS missions, mission planning, and telecommunications system design.